

REMARKS

Applicant has carefully examined the Office Action of January 21, 2009, in which claims 1-15 are pending and were rejected. Favorable reconsideration is requested in light of the above amendments and following remarks.

Claim Rejections under 35 U.S.C. § 112

Claims 1-15 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicants regard as the invention.

Specifically, language in claims 1, 2, 9 and 10 that related to aspiration was objected to. In view of the objections raised, the language in these claims has been revised to conform more fully with standard usage. No new matter has been introduced. Applicant therefore submits that the claims are in conformity with 35 U.S.C. §112 and request the withdrawal of the rejection.

Additional Claim Amendments

Claims 1 and 9 were also amended to more particularly claim what Applicant regards as the invention. Support for such amendments may be found, for example, in paragraphs 24, 25 and 28 of the published application. No new matter has been introduced.

Claim Rejections under 35 U.S.C. § 103

Claims 1-15 were rejected under 35 U.S.C. §103(a) as being unpatentable over Stumpf, U.S. Patent No. 4,039,799, in view of Han et al., U.S. Patent No. 6,864,190, in view of Foster et al., U.S. Patent No. 6,823,763, in view of Ganser et al., U.S. Patent No. 6,907,798. Applicant respectfully traverses the rejection.

Stumpf discloses a device for cutting sheet material, especially layers of textile material, by means of a thermal cutting beam, such as a laser beam 10. According to Stumpf, the material to be processed is supported on a perforated plate 7 which is disposed on bearer strips 14 of a table 1, which perforated plate 7 allows dissipation of any heat imparted thereto. The laser beam 10 is generated by means of a laser gun 8 and is radiated by means of an optical system 9 toward mirror assemblies 11, 12 to reach a focusing device 13 that is mounted on a carriage 4 that can be

displaced above the table 1 along travel rails 5. The carriage 4 and travel rails 5 are mounted on another carriage 2 so as to be displaceable transversely to the direction of displacement of the first carriage 4.

It is therefore to be appreciated that Stumpf teaches a device wherein the material to be processed will remain immobile during the laser cutting process, the focusing head 13 being displaced above the surface of the material to be processed by means of the carriages 2, 4 so as to appropriately direct the laser beam 10 to the relevant portions of the material to be processed.

The Office Action claims that Stumpf describes an X-Y translation laser cutter “*and aspiration or vacuum holding table*”. Applicant respectfully disagrees. Stumpf merely teaches at column 2, lines 33-37, that fumes produced by the cutting process are sucked-away downwardly either through the perforated table-top 7 or directly downwardly by a suction means (not shown) disposed under the table-top 7. There is, however, no disclosure whatsoever in Stumpf of any aspiration box or like means to draw the material to be processed against an aspiration surface during the cutting process. According to Stumpf, the material to be processed is merely resting against the table-top 7, the perforations in the table-top 7 being intended to favor dissipation of heat (see column 2, lines 5-9).

Stumpf therefore at least differs from the subject matter of claims 1 and 9 in that: Stumpf does not disclose or teach any transfer system or means for holding the material to be processed and transporting this material in front of the laser-cutting system; and Stumpf does not disclose any aspiration/suction means to draw and hold the material to be processed against an aspiration/suction surface during the laser-cutting process. Stumpf does not teach a machine or process as claimed wherein cutting of an opening into a substrate is carried out by directing a laser beam through a cutting opening provided in an aspiration surface against which the substrate is drawn during the cutting operation.

Han et al. teach a process for fabricating luminescent porous material, which process comprises pre-treating a substrate (e.g., crystalline silicon) 100 (Figure 1), 200 (Figure 2) with laser radiation. According to a first embodiment of Han et al. (see Figure 1), the substrate 100 is held in place on an x-y motion stage 101 (Figure 1) by means of a holder and spacer arrangement 102, 103. According to a second embodiment of Han et al. (see Figure 2), the substrate 200 is held to the underside of a holder 202 by means of a fastener 203.

Han et al. do not disclose any aspiration/suction means to draw the substrate to be processed against any sort of aspiration/suction surface during the laser processing. Rather, the substrate of Han et al. is firmly held in place by the holder arrangements 102/103, 202/203.

Han et al. therefore at least differ from the subject matter of claims 1 and 9 in that: Han et al. do not disclose or teach any transfer system or means for holding the material to be processed and transporting this material in front of the laser-cutting system; and Han et al. do not disclose any aspiration/suction means to draw the material to be processed against an aspiration/suction surface during the laser-cutting process. Fundamentally, Han et al. do not teach a machine or process as claimed wherein cutting of an opening into a substrate is carried out by directing a laser beam through a cutting opening provided in an aspiration surface against which the substrate is drawn during the cutting operation.

Foster et al. disclose a fabric cutting system for cutting a pre-selected pattern from a fabric stock and transferring the cut fabric piece to a workstation. As shown in Figure 1 of Foster et al., a cutter assembly 500 is provided to cut the fabric piece, the fabric stock being conveyed on a conveyor 400 comprising a hold down table 430 with at least one vacuum source 440 to hold the fabric stock down by an adequate amount of pressure (see column 4, lines 25-38). Downstream of the cutter assembly 500 there is further provided a pickup assembly 600 comprising a vacuum plenum 610 that is used to pick-up the cut fabric piece from the conveyor 400 by suction. It is to be appreciated that the vacuum plenum 610 is not used during the cutting process, but rather only after a pre-selected piece of the fabric stock has been cut by the cutter assembly.

Thus, even though Foster et al. disclose aspiration/suction means 600 that are located on the same side as the cutter means 500, these aspiration/suction means 600 are merely used to pick up the cut piece after the cutting operation has been completed. In any case, Foster et al. do not teach a machine or process as claimed wherein cutting of an opening into a substrate is carried out by directing a laser beam through a cutting opening provided in an aspiration surface against which the substrate is drawn and held during the cutting operation.

Ganser et al. disclose a device for laser-cutting preparations which comprises an X-Y table 2 and a U-shaped holding device 14 arranged on the X-Y table 2 for accommodating an object support 6 with a preparation 8. According to Ganser et al., the object support 6 is merely resting on the upper surface of the U-shaped holding device 14 such that the preparation 8, which

is situated on an underside of the object support 6, is located immediately above a clearance 32 provided in the U-shaped holding device 14, which clearance 32 lies above a cut-out 26 formed in the table 2. In this way, small parts of the preparation 8 can be cut by a laser beam 38 to fall into a container 12 of a collecting device 10.

Ganser et al. do not teach any sort of aspiration/suction means to hold the object to be processed (namely the object support 6 with its preparation 8), even less such aspiration/suction means having an aspiration surface provided with a cutting opening through which the laser beam is directed during the cutting operation.

When all the words in the claim are considered in judging the patentability of claims 1 and 9 against the prior art, Applicant respectfully submits that patentability over the cited references is clear. Claim 1, for example, recites, "wherein said aspiration box...further comprises a bottom wall with aspiration openings to draw and hold said substrate against the bottom wall of the aspiration box by suction and a cutting opening through which said laser beam is directed onto the substrate," elements not taught or suggested by the prior art. Claim 9 recites, for example, "drawing said substrate against an aspiration surface by suction to hold said substrate against said aspiration surface" and "evacuating the cut part of said substrate during the step of drawing said substrate against an aspiration surface," steps not disclosed or suggested by the prior art or possible using the apparatus taught by the prior art. Applicant therefore submits that independent claims 1 and 9 are in condition for allowance over the cited prior art.

Claim 4 was rejected under 35 U.S.C. §103(a) as being unpatentable over Stumpf in view of Han et al. in view of Foster et al. in view of Ganser et al. as applied to claim 3 above and further in view of Shinohara et al., U.S. Patent No. 4,527,042; claim 5 was rejected under 35 U.S.C. §103(a) as being unpatentable over Stumpf in view of Han et al. in view of Foster et al. in view of Ganser et al. as applied to claim 1 above and further in view of Morrison, U.S. Patent No. 5,337,639; and claims 8 and 15 were rejected under 35 U.S.C. §103(a) as being unpatentable over Stumpf in view of Han et al. in view of Foster et al. in view of Ganser et al. as applied to claims 1 and 9 above and further in view of Kaye et al., U.S. Patent No. 6,343,639. Applicant respectfully traverses the rejections.

None of the cited references remedy the deficiencies discussed above with respect to Stumpf, Han et al., Foster et al. or Ganser et al. As such, Applicant submits that these claims are

in condition for allowance for at least the reason that they depend, directly or indirectly, from claims 1 or 9, and contain additional limitations.

Reexamination and reconsideration are respectfully requested. It is respectfully submitted that all pending claims are now in condition for allowance. Issuance of a Notice of Allowance in due course is requested. If a telephone conference might be of assistance, please contact the undersigned attorney at (612) 677-9050.

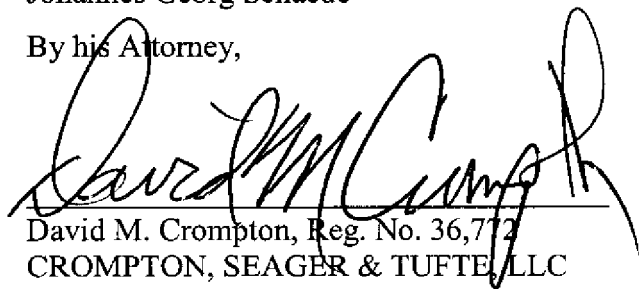
Respectfully submitted,

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By his Attorney,

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